

## **GOAL 3**

### **PRESERVE AND RESTORE THE LAND**

*Preserve and restore the land by reducing and controlling risks posed by releases of harmful substances; promoting waste diversion, recycling, and innovative waste management practices; and cleaning up contaminated properties to levels appropriate for their beneficial reuse.*

EPA will work to preserve and restore the land using the most effective waste management and cleanup methods available. Left uncontrolled, hazardous and nonhazardous wastes on the land can migrate to the air, groundwater, and surface water, contaminating drinking water supplies, causing acute illnesses or chronic diseases, and threatening healthy ecosystems in urban, rural, and suburban areas. Hazardous substances can kill living organisms in lakes and rivers, destroy vegetation in contaminated areas, cause major reproductive complications in wildlife, and otherwise limit the ability of an ecosystem to survive.

EPA uses a hierarchy of approaches to protect the land: reducing waste at its source, recycling waste, and managing waste effectively by preventing spills and releases of toxic materials and cleaning up contaminated properties. The Agency is especially concerned about threats to our most sensitive populations, such as children, the elderly, and individuals with chronic diseases.

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, or Superfund) and the Resource Conservation and Recovery Act (RCRA) provide the legal authority for most of EPA's work toward this goal. The Agency and its partners use Superfund authority to clean up uncontrolled or abandoned hazardous waste sites and return the land to productive use. Under RCRA, EPA works in partnership with states and tribes to address risks associated with leaking underground storage tanks (LUSTs) and with the generation and management of hazardous and nonhazardous wastes at active facilities.

EPA also uses authorities provided under the Clean Air Act, Clean Water Act, and Oil Pollution Act of 1990 to protect against spills and releases of hazardous materials. Controlling the many risks posed by emergency releases of harmful substances presents a significant challenge to protecting the land. EPA uses an approach that integrates prevention, preparedness, and response activities to minimize these risks. Spill prevention activities keep harmful substances from being released to the environment. Improving EPA's readiness to respond to emergencies through training, development of clear authorities, and provision of proper equipment will ensure that we are adequately prepared to minimize contamination and harm to the environment when spills do occur.

## OBJECTIVES

**Objective 3.1: Prevention of, Preparedness for, and Response to Accidental and Intentional Releases.** By 2008, reduce and control the risks posed by accidental and intentional releases of harmful substances by improving our nation's capability to prevent and respond more effectively to these emergencies.

**Sub-objective 3.1.1: Preparedness for Emergencies.** By 2008, improve the Agency's emergency preparedness by achieving and maintaining the capability to respond to simultaneous large-scale emergencies, and increasing response readiness by XX% (from a baseline established in FY 2003).

**Sub-objective 3.1.2: Respond to Hazardous Substances Releases and Oil Spills.** By 2008, EPA will increase the cumulative number of responses to hazardous substance releases from 7,469 to 9,219 and to oil spills from 2,958 to 4,458.

**Sub-objective 3.1.3: Prevent Oil Spills.** By 2008, reduce releases to the environment from oil facilities by increasing the number of those facilities in compliance from 3,525 to 6,000 where the universe of oil facilities is about 415,000.

## Means and Strategies to Achieve Objective 1

### Prevention, Preparedness, and Response

EPA plays a major role in reducing the risks posed to human health and the environment, especially our land resources and natural ecosystems, from accidental and intentional releases of harmful substances and oil. Under the National Response System (NRS), EPA evaluates and responds to thousands of releases annually. The NRS is a multi-agency preparedness and response mechanism which includes the following key components: the National Response Center; the National Response Team, composed of 16 federal agencies; 13 Regional Response Teams; and federal On-Scene Coordinators (OSCs). These organizations work with state and local officials to develop and maintain contingency plans that will enable the Nation to respond effectively to hazardous substance and oil emergencies. When an incident occurs, these groups will coordinate with the OSC in charge to ensure that all necessary resources, such as personnel and equipment, are available and that containment, cleanup, and disposal activities proceed quickly, efficiently, and effectively. EPA's primary role in the NRS is to serve as the federal OSC for spills in the inland zone. As a result of NRS efforts, the Nation has successfully contained many major oil spills and releases of hazardous substances, minimizing the adverse impact on human health and the environment.

EPA's emergency preparedness, prevention, and response staff are vital to meeting the targets established for prevention, preparedness, and response. The Agency will continue to develop technical personnel in the field, ensuring their readiness and protecting their health and safety when responding to releases of dangerous materials. In addition, EPA will strengthen its information infrastructure by making information management decisions Agency-wide and by improving operations and the security, collection, and exchange of information.

### Preparing for Emergencies

Preparedness on a national level is essential to ensure that emergency responders are able to deal with multiple, large-scale emergency incidents, including those that may involve biological agents or weapons of mass destruction. Over the next several years, EPA will enhance its core emergency response program to respond quickly and effectively to chemical, biological, and radiological incidents or releases and will improve coordination mechanisms to enable response to simultaneous, large-scale national emergencies, including homeland security incidents. We will focus our efforts on Regional Response Teams and coordination among regions; health and safety issues, including identification, clothing, training, and exercise; establishment of delegation and warrant authorities; response readiness, including equipment; transportation; and outreach. The criteria for excellence in the EPA's core emergency response program will ensure a high level of overall readiness throughout the Agency and improve our ability to support multi-regional responses.

In addition to enhancing its readiness capabilities, the Agency will work to improve internal and external coordination and communication mechanisms. For example, as part of the National Incident Coordination Team (NICT), EPA will continue to improve its policies, plans, procedures, and decision-making processes for coordinating response to national emergencies. Under the Continuity of Operations/Continuity of Government program, we will upgrade and test plans, facilities, training, and equipment to ensure that essential government business can continue during a catastrophic emergency. NRT capabilities are being expanded to coordinate interagency activities during large-scale responses and to carry out future assignments from the Department of Homeland Security. EPA will coordinate its activities with the Department of Homeland Security, Federal Emergency Management Administration (FEMA), Federal Bureau of Investigation (FBI), other federal agencies, and state and local governments and will continue to clarify its roles and responsibilities to ensure that Agency security programs are consistent with the national homeland security strategy.

### Responding to Hazardous Substances Releases and Oil Spills

Each year, EPA personnel assess, respond to, mitigate, and clean up thousands of releases, whether accidental, deliberate, or naturally occurring. These incidents range from small spills at chemical or oil facilities to national disasters such as hurricanes, earthquakes, terrorist events like the

September 11 World Trade Center and anthrax attacks, and the Columbia shuttle tragedy.

EPA will work to improve its capability to respond effectively to incidents that may involve harmful chemical, biological, and radiological substances. To implement its effectiveness strategy, the Agency will explore improvements in response readiness levels, including field and personal protection equipment and response training and exercises; review response data provided in the “after-action” reports prepared by EPA emergency responders following a release; and examine “lessons learned” reports to identify which activities work and which need to be improved. Application of this information and other data will improve the Agency’s response operations and advance the state-of-the-art of emergency response.

### Preventing Oil Spills

An important component of EPA’s land strategy is preventing oil spills from reaching our Nation’s waters. Under the Oil Pollution Act, the Agency requires certain facilities to develop and implement spill prevention, control, and countermeasure (SPCC) plans. SPCC plans ensure that facilities put in place containment and other countermeasures that would prevent oil spills from reaching navigable waters. Facilities that are unable to provide secondary containment, such as berms around an oil storage tank, must provide a spill contingency plan as part of their SPCC plan that details clean-up measures to be taken if a spill occurs. Compliance with these requirements reduces the number of oil spills and helps prevent detrimental effects on human health and the environment should a spill occur.

**Objective 3.2: Waste Reduction, Recycling, and Safe Waste Management.** By 2008, reduce adverse effects to land by reducing waste generation, increasing recycling, and ensuring proper management of waste and petroleum products at facilities in ways that prevent dangerous releases.

**Sub-objective 3.2.1: Reduce Waste Generation and Increase Recycling.** By 2008, decrease the impact of waste disposed on the land by reducing materials and energy use through product and process redesign, and by increasing materials and energy recovery from wastes otherwise requiring disposal.

#### Strategic Targets:

- By 2008, maintain the national average municipal solid waste generation at 4.5 pounds per person per day.
- By 2008, increase municipal solid waste recycling to 35% from 31% in 2002.

**Sub-objective 3.2.2: Prevent Dangerous Releases from RCRA Facilities.** By 2008, prevent dangerous releases to the environment from RCRA hazardous waste management facilities.

Strategic Targets:

- By 2008, increase the percentage of RCRA hazardous waste management facilities with approved controls in place from 87% to 98%.
- Approximately 36% of the facilities that are due for permit renewals by the end of 2006 will have updated controls approved by the end of 2008.
- By 2008, reduce hazardous waste combustion facility emissions of dioxins and furans by 90%, particulate matter by 50% and acid gases by 50% from levels emitted in 1994.

**Sub-objective 3.2.3 Reduce Releases from USTs.** By 2008, reduce releases to the environment from underground storage tanks (USTs) by increasing the percentage of UST facilities that are in significant operational compliance from 65% to 80%.

## Means and Strategies to Achieve Objective 2

### Waste Reduction and Recycling

EPA's strategy for reducing waste generation and increasing recycling is based on (1) establishing and expanding partnerships with businesses, industries, states, communities, and consumers; (2) stimulating infrastructure development, product stewardship, and new technologies; and (3) helping businesses, government, institutions, and consumers by providing education, outreach, training, and technical assistance.

### The Resource Conservation Challenge

The Resource Conservation Challenge (RCC) is the Agency's primary vehicle for implementation of this multi-component strategy. The RCC represents a major national effort to find flexible yet protective ways to conserve our valuable natural resources through waste reduction, recycling, and energy recovery. The program is designed to elicit a response from all Americans, since we all have opportunities to reduce the waste we produce and to increase recycling. Through the RCC, EPA challenges Americans to make purchasing and disposal decisions that conserve our natural resources, save energy, reduce costs, and preserve the environment for future generations.

The RCC reaches beyond municipal solid waste; it promotes reduction, recycling, and pollution prevention in the generation and management of industrial solid and hazardous wastes as well. Many materials that are currently managed as “wastes” and sent to land disposal facilities can be recycled and put to beneficial uses. Coal combustion products, metal-bearing industrial byproducts, foundry sands, electronic equipment, and used tires are some examples. In many cases, making changes in industrial or commercial processes can eliminate or reduce waste generation in the first place. EPA is working closely with states and other stakeholders to reduce and recycle municipal and industrial wastes. As part of this effort EPA will also carefully review waste generation and waste management practices to identify opportunities to reduce wastes, remove barriers to recycling and recovery, and promote beneficial uses.

EPA is assuming a national leadership role in working with its partners to identify additional goals that will supplement our current targets. These goals will reflect the evolving, expanded effort the Agency is beginning in 2003 to decrease use and increase recovery of materials and energy through recycling, waste minimization, and other approaches. (Also see Objective 2 under Goal 5, Compliance and Environmental Stewardship, for a discussion of our plans to reduce priority-list chemicals in hazardous waste streams.)

#### Establishing and Expanding Partnerships

EPA will establish and expand partnerships with industry, states, and other entities to reduce waste and to develop and deliver tools that can help businesses, manufacturers, and consumers. Nationally recognized programs such as WasteWise, which uses partnerships to encourage waste prevention and recycling, will serve as models for new alliances between federal, state, and local governments and businesses that capitalize on voluntary efforts to reduce waste and increase recycling. EPA and the Nation will also continue to benefit from well-established programs. For example, through 2001, WasteWise partners reduced over 35 million tons of waste through waste prevention and recycling efforts, and EPA estimates that, since the program’s inception, partners have prevented the emission of nearly 30 million tons of carbon equivalent, as much as would be realized by removing more than 20 million cars from the road for 1 year.

Another example of an expanded partnership program is the WasteWise Building Challenge, which EPA initiated in 2002. This program will continue to promote development of new tools, such as waste hauling contracts that provide financial incentives for haulers to identify and implement cost-effective, resource-efficient source reduction and recovery. The National Waste Minimization Partnership Program, discussed among the pollution prevention activities conducted under Goal 5, is a further example of a waste reduction strategy. In this case, partnerships target 30 hazardous waste chemicals for reduction by altering manufacturing practices and implementing recycling efforts. EPA will continue to foster such public-private partnerships to prompt new waste reduction, reuse, and

recycling initiatives.

#### Stimulating Infrastructure Development, Product Stewardship and New Technologies

Another key strategy for reducing waste is fostering development of infrastructure that will make it easier for businesses and consumers to reduce the waste they generate, acquire and use recycled materials, and purchase products containing recycled materials.

EPA will continue to promote development of new and better recycling technologies and explore ways to obtain energy or products from waste. Several initiatives already underway demonstrate the potential of such efforts. EPA has established voluntary product stewardship partnerships with manufacturers, retailers, government, and non-governmental organizations to reduce the life-cycle impacts of electronics and carpets. In January 2002, EPA, a carpet trade association, major manufacturers, and a variety of state and regional government organizations signed a breakthrough Memorandum of Understanding (MOU) to substantially reduce the amount of used carpet going to landfills. The MOU also created a new industry-funded organization to support the development of recycling infrastructure and provide for government procurement and market development initiatives to support this undertaking. In the coming years, EPA will pursue similar infrastructure-building efforts. The Agency will continue its work to establish programs for recycling cathode ray tubes (CRTs), which account for some of the largest volumes of recyclable materials in computer and electronics waste streams. EPA recently published proposed revisions to controls over CRT recycling to promote development of a safe, nationwide recycling infrastructure and market for used CRTs.

EPA will also promote development of new and better recycling technologies and explore ways to obtain energy or products from waste. Through bioreactor technology, the collection of landfill gases containing methane offers promise as a future source of energy. The Agency will continue to support several on-going initiatives that revamp technologies to reduce or eliminate the use of virgin materials, recover energy to produce power, and improve waste management.

#### Education, Outreach, Training and Technical Assistance

EPA will continue to work with major retailers, electronics manufacturers, and the amusement and motion picture industries to revitalize, create, and display conservation, waste prevention, and recycling messages. Communicated via movie and video trailers, posters targeted to schoolchildren, in-store displays and advertisements, and print and broadcast public service announcements, the messages will encourage consumers, young people, and under-served communities to make smarter, more responsible environmental decisions. The Agency and its partners will design activities that encourage students and teachers to start innovative recycling programs and will develop unique tools and projects

to promote waste reduction, recycling, and neighborhood revitalization in Hispanic and African-American communities and on Indian lands.

EPA has direct implementation responsibility for RCRA hazardous waste and UST programs in Indian country. Recognizing the unique challenges encountered on tribal lands, EPA will work with tribes on a government-to-government basis that affirms the federal government's vital trust responsibility to 572 tribal governments and recognizes the importance of conserving natural resources for cultural uses. Working with other federal agencies, EPA will continue to help its tribal partners improve practices for managing solid waste. We will conduct joint projects to upgrade tribal solid waste management infrastructure, including plans, codes and ordinances, recycling programs, and other alternatives to open dumping. These efforts will help to prevent open dumping in Indian country in the future and allow clean up of existing dumps, reducing the risks that such dumps pose to health and the environment..

### **Preventing Dangerous Releases from RCRA Facilities**

Recognizing that some hazardous wastes cannot yet be completely eliminated or recycled, the RCRA program works to reduce the risks of exposure to hazardous wastes by maintaining a "cradle-to-grave" approach to waste management.

#### Working With State Partners in Implementing the Regulatory Framework

Hazardous waste management facilities with appropriate controls in place have already made significant progress in minimizing exposure to hazardous substances. Achieving greater efficiencies at waste management facilities through more focused permitting processes while tightening standards where appropriate are the bases of EPA's strategy to address hazardous wastes that must be treated or stored. EPA will work with its state, tribal, and local government partners to ensure that hazardous waste management facilities have approved controls in place and continue to strive for safe waste management.

To accomplish this Objective, EPA will work with authorized states, specifically those with a large number of facilities lacking approved controls in place, to help resolve issues and transfer successful strategies from other states. EPA also plans to study the universe of un-permitted facilities and work with states to identify and resolve issues that may be preventing key categories of facilities from obtaining permits or putting other approved controls in place. To achieve greater efficiencies at facilities that treat or store hazardous waste, the Agency will also promote new innovative technologies that streamline permitting processes and improve protection of human health and the environment.

#### Reducing Hazardous Waste Combustion Emissions



EPA will continue to develop and issue regulations regarding emissions standards for hazardous waste combustion facilities. Implementation of these regulations is key to reducing the emission of dioxins, furans, particulate matter, and acid gases. Within 2 years from the date that EPA issues new limits, facilities will conduct emissions tests to demonstrate their reductions. Additional periodic tests will ensure continued compliance with the limits established for emissions.

#### Application of Biosolids (Sewage Sludge)

EPA's Office of Water regulates the application of biosolids (sewage sludge) to land and works to improve state and industry implementation of the regulations. In 2002, the National Academy of Sciences reviewed EPA's biosolids land application program. In the coming years, EPA will be responding to this report, discharging its regulatory responsibilities under the Clean Water Act, and conducting program implementation activities.

#### **Preventing Leaks from Underground Storage Tanks**

EPA recognizes that, because of the size and diversity of the regulated community, state and local governments are in the best position to regulate USTs. RCRA Subtitle I allows state UST programs approved by EPA to operate in lieu of the federal program. Furthermore, state and local authorities, who are closer to the situation in their domain, are likely in the best position to set priorities. Even states that have not received formal state program approval from EPA are in most cases the primary implementing agencies (excepting in Indian country) and receive annual grants from EPA.

EPA will continue to work with its state and tribal partners to prevent and detect petroleum releases from USTs by ensuring that compliance with leak detection and leak prevention (spill, overfill, and corrosion protection) requirements is a national priority. While the vast majority of the approximately 698,000 active USTs have the equipment required under the regulations, significant work remains to ensure that UST owners and operators properly maintain and operate their systems. Therefore, to protect our Nation's ground water and drinking water from petroleum releases, EPA will continue to support state programs, strengthen partnerships among stakeholders, and provide technical and compliance assistance and training to promote and enforce petroleum management controls at UST facilities.

In addition, EPA will continue to work with states to obtain their commitments to increase their inspection and enforcement presence if state-specific goals are not met. The Agency and states will use innovative outreach and education tools to bring more tanks into compliance. For example, multi-site agreements can be effective in bringing a single tank owner with multiple sites into compliance.

The Agency will also provide guidance to foster the use of new technology to enhance

compliance. For example, the presence of methyl-tertiary-butyl-ether (MTBE) in gasoline increases the importance of preventing and rapidly detecting releases, since MTBE cleanups can cost 100 percent more than cleanups involving other gasoline contaminants. The Agency will focus its efforts on reducing UST releases and increasing early detection of petroleum products, including MTBE, by further evaluating the performance of compliant UST systems

While the frequency and severity of releases have been greatly reduced, EPA and its state partners have observed that releases are still occurring. Although there are many factors that may actually lead to an increase in reported releases from USTs, improper operation and maintenance of UST equipment contribute to these continued problems, as do problems with the equipment itself. Therefore, in FY 2004, the Agency will continue its evaluation of the performance of new or upgraded UST systems to better identify the sources and causes of releases and to determine the success of leak detection systems in quickly identifying releases. The Agency will also continue to identify opportunities for improving UST system performance.

**Objective 3.3: Cleanup and Reuse of Contaminated Land.** By 2008, control the risks to human health and the environment at contaminated properties or sites, and make land available for reuse.

**Sub-objective 3.3.1: Control Risks at Contaminated Sites.** By 2008, risks to human health and the environment at contaminated sites will be controlled through cleanup, assessment, stabilization, or other action.

Strategic Targets:

- **Site Assessments:** By 2008, EPA and its partners will perform site assessments leading to final assessment decisions (no further action or identification of appropriate cleanup program). (Under Superfund, assessments will be performed at 100,000 sites, leading to 41,700 final decisions, and under RCRA, 90% of facilities requiring such screening will be assessed.)
- **Current Human Exposures Under Control:** By 2008, EPA will determine that all identified current human exposure from contamination at sites are under control or below health-based levels for current land and/or groundwater use conditions. This environmental indicator does not consider potential future land or groundwater uses or ecological receptors. (Determination will occur at 95% of relevant RCRA facilities and 84% of Superfund sites.)
- **Groundwater Migration Under Control:** By 2008, EPA will determine that the

migration of contaminated groundwater from sites is controlled through engineered remedies or natural processes, to prevent human exposures and unacceptable discharge levels to surface water, sediments or ecosystems at the site. (Determination will occur at 70% of relevant RCRA facilities and 65% of Superfund sites.)

- **Remedy Selections:** By 2008, EPA and its partners will determine that final remedies, designed to clean up contamination to risk levels that are protective of human health and the environment and appropriate for reasonably anticipated future land use, have been selected at 70% of relevant RCRA facilities and 1,223 Superfund sites.
- **Cleanups:** By 2008, EPA and its partners will determine that cleanups are completed at 105,000 LUST sites. Additionally, EPA and its partners will determine that construction of remedies, designed to clean up contamination to risk levels that are appropriate for the next reasonably anticipated future land use, is complete at 50% of relevant RCRA facilities and 1,086 Superfund sites.

**Sub-objective 3.3.2: Make Land Available for Reuse.** Through 2008, land will be made available for reuse through cleanup, assessment, stabilization, or other action which indicates that such lands are restored to levels that are protective for the next reasonably anticipated future land use. (A strategic target for EPA-lead sites is under development.)

**Sub-objective 3.3.3: Maximize Potentially Responsible Party Participation at Superfund Sites.** Through 2008, conserve Superfund trust resources by ensuring that potentially responsible parties conduct or pay for Superfund cleanups whenever possible.

Strategic Targets:

- Through 2008, EPA will reach a settlement or take an enforcement action by the time of the Remedial Action (RA) start at 90% of Superfund sites (with RA starts during the fiscal year) that have known non-Federal, viable, liable parties.
- Through 2008, EPA will address all Statute of Limitations (SOL) cases for Superfund sites with unaddressed total past costs equal to or greater than \$200,000.

## Means and Strategies to Achieve Objective 3

Contaminated land poses a risk to human health and the environment. Leaching contaminants can foul drinking water in underground aquifers used for wells or surface waters used by public water intakes. Contaminated soil can result in human ingestion or dermal absorption of harmful substances. Contamination can also impact subsistence resources, including resources subject to special protections due to treaties between federal and tribal governments. Furthermore, because of the risks it poses contaminated land may not be available for use. EPA and its partners work to clean up contaminated land to levels sufficient to control risks to human health and the environment and ultimately to return the land to productive use. The Agency's clean-up activities, some new and some well-established, include removal of contaminated soil, capping or containment of contamination in place, groundwater pump-and-treat activities, and bioremediation.

EPA uses a variety of tools to accomplish cleanups: permits, enforcement actions, consent agreements, Federal Facilities Agreements (FFAs), and many other mechanisms. As part of EPA's One Clean-up Program Initiative, programs at all levels of government will work together to ensure that appropriate clean-up tools are used; that resources, activities, and results are coordinated with partners and stakeholders and communicated to the public effectively; and that cleanups are protective and contribute to community revitalization. This approach reflects EPA's efforts to coordinate across all of its clean-up programs, while maintaining the flexibility needed to accommodate differences in program authorities and approaches.

EPA fulfills its clean-up and waste-management responsibilities on tribal lands by acknowledging tribal sovereignty and recognizing tribal governments as the most appropriate authorities for setting standards, making policy decisions, and managing programs consistent with Agency standards and regulations.

Through strong policy, leadership, program administration and a dedicated workforce, EPA's clean-up programs will merge sound science, cutting-edge technology, quality environmental information, and stakeholder involvement to protect the Nation from the harmful effects of contaminated property. To accomplish its clean-up goals, the Agency will continue to forge partnerships and develop outreach and education strategies.

### **Assessment, Stabilization, and Clean Up**

EPA and its partners follow four key steps to accomplish cleanups and control risks to human health and the environment: assessment, stabilization, selection of appropriate remedies, and implementation of remedies. We will continue to work with our federal, state, tribal, and local government partners at each step of the process to identify facilities and sites requiring attention and to monitor changes in priorities, addressing new priority sites or removing previously identified facilities that will be addressed through other mechanisms. As they modify existing systems and approaches and

create new ones, clean-up programs will also continue to develop guidance for accomplishing each of these steps.

### Assessment of Sites

All programs assess preliminary site information to identify potential exposures and sites or facilities that require further action. These assessments flag sites that will require priority action to protect human health and the environment and also direct site owners and operators to the appropriate authorities for follow-up. EPA conducts site assessments with all partners who share authority for the site in order to establish a common base of information for all stakeholders.

### Stabilization of Sites

“Stabilization” refers to the initial actions taken to control actual or potential exposure, based on current land and groundwater usage. Site stabilization can include activities such as installing fences, slurry walls, pump-and-treat systems, or permeable reactive walls. Where appropriate, these actions are taken immediately to protect populations located within a reasonable distance from the site from exposure to harmful contaminants.

### Selection of Site Remedies

In selecting final remedies, the Agency seeks to address all current and potential sources of contamination that threaten human health and the environment. Remedies are selected based on many criteria, including protectiveness offered, environmental media clean-up objectives, short- and long-term effectiveness, implementation issues, and acceptability to state and tribal governments and the affected community. In selecting remedies, EPA and its partners also consider reasonably anticipated future land use.

### Implementation of Site Remedies

Implementation or construction of the site remedy is the first step in the final remediation process. Following implementation, EPA encourages monitoring of the site to ensure that the cleanup adequately protects human health and the environment.

The Agency is also planning several projects to help us characterize the benefits of various clean-up programs. These pilot projects are intended to evaluate (1) the feasibility of estimating the number of people whose potential exposure to hazardous substances has been reduced as a result of clean-up activities, (2) the degree to which ecological receptors are protected from hazardous substances through clean-up activities, and (3) the economic impact of clean-up activities.

## **Reuse and Restoration**

Usable land is a valuable resource. However, where contamination presents a real or perceived threat to human health and the environment, options for future land use at that site may be limited. EPA's clean-up programs have set a national goal of returning formerly contaminated sites to long-term, sustainable, and productive use. This goal creates greater impetus for selecting and implementing remedies that, in addition to providing clear environmental benefits, will support reasonably anticipated future land use options and provide greater economic and social benefits.

EPA is evaluating its policies and guidelines to determine where it can refine its approach to cleanups to facilitate beneficial site reuse. EPA is also forming partnerships with states, tribes, other federal agencies, local governments, communities, land owners, lenders, developers, and parties potentially responsible for contamination that can help bring about reuse of formerly contaminated sites.

(Also see the discussion of EPA's Brownfields Program under Goal 4, Healthy Communities and Ecosystems.)

## **Responsible Party Participation**

Enforcement authorities play a critical role in all Agency clean-up programs. However, enforcement authorities have an additional and unique role under the Superfund program, where they are used to leverage private-party resources to conduct a majority of the clean-up actions and to reimburse the federal government for cleanups financed by the Trust Fund. EPA will continue to pursue the following two strategies for limiting the use of trust funds:

### "Enforcement First" under Superfund

Historically, EPA has achieved at least \$6 in private-party clean-up commitments for every \$1 spent on enforcement. The Agency will continue to use its enforcement authorities to achieve this end. The Superfund program's "Enforcement First" strategy will allow EPA to focus limited Trust Fund resources on sites where viable, potentially responsible parties do not exist or lack the funds or capabilities needed to conduct the cleanup. By taking enforcement actions at sites where viable, liable parties do exist, EPA will continue to leverage private-party dollars so that Trust Fund money is used only when absolutely necessary to clean up hazardous waste sites.

### Cost Recovery

Cost recovery is another way to leverage private-party resources through enforcement. Under

Superfund, EPA has the authority to compel private parties to pay back Trust Fund money spent to conduct clean-up activities. EPA will continue its efforts to address 100 percent of the Statute of Limitations cases for Superfund sites with unaddressed total past costs equal to or greater than \$200,000 and to report the value of costs recovered.

**Objective 3.4: Science/Research.** Through 2008, provide and apply a sound scientific foundation to EPA's pursuit of protecting and restoring land by conducting leading edge research and development of better understanding and characterization of environmental outcomes under Goal 3.

**Sub-objective 3.4.1: Conduct Research to Support Land Activities.** Through 2008, conduct leading-edge, sound scientific research to provide a foundation for preservation of land quality and remediation of contaminated land. Research will result in documented methods, models, assessments, and risk management options for Program and Regional Offices, facilitating their accurate evaluation of effects on human health and the environment, understanding of exposure pathways, and implementation of effective risk management options.

**Sub-objective 3.4.2: Science to Preserve and Remediate Land.** Through 2008, provide a program based on sound science, and continuously integrate smarter technical solutions and protection strategies that enhance our ability to preserve land quality and remediate contaminated land for beneficial reuse.

## **Means and Strategies to Achieve Objective 4**

### **Science to Preserve and Remediate Land**

EPA will continue to improve and demonstrate its capability to assess environmental conditions and determine the relative risks that contaminated land poses to health and the environment. The Agency will ensure that the environmental data it collects is of known, documented, and acceptable quality by implementing necessary field and lab procedures, practices, and controls. We will continue integrating technological advances to enhance our site investigation capabilities, implement cost-effective remedies, and improve the operation and maintenance of existing remedies. In addition, EPA will continue to coordinate with other agencies to identify and communicate program research priorities.

### **Research to Preserve and Remediate Land**

To support achievement of its objectives for land, EPA has developed multi-year plans for research on contaminated sites, RCRA issues, and biosolids (as part of its water quality research). Each of the Agency's research plans outlines long-term targets for reducing scientific uncertainties

associated with these topics.

Research activities related to contaminated sites will include demonstrating and verifying cost-effective technologies for characterization and remediation of contaminated sites through the Superfund Innovative Technology Evaluation program; providing site-specific technical assistance (including models) during all phases of characterization and remediation of contaminated sites; and providing support and advice to further the application of sound science in regulatory and non-regulatory efforts (rule-making, developing guidance, and other activities). More specifically, Agency goals for research on contaminated sites will:

- Aid in the selection of protective, cost-effective remedies for contaminated sediment by improving risk and site characterization and increasing understanding of different remedial options;
- Provide decision makers with performance and cost information on alternatives to pump-and-treat remedies for ground water and tools for ground water characterization and assessment;
- Provide tools and methods to assess, remediate, and manage soil and land efficiently at contaminated sites; and
- Provide scientific tools, methods, models, and technical support to characterize multimedia site contamination; assess, predict, and communicate risks; evaluate innovative remediation options; develop testing protocols and risk management strategies; and identify fate and effects of oil spills.

EPA will focus its RCRA-related research primarily on treatment processes for hard-to-treat chemicals; innovative containment technologies; and site-specific technical support and state-of-the-art methods, tools, and models for addressing priority RCRA management issues. More specifically, the Agency's goals for RCRA research will:

- ▼ Improve resource conservation and waste management for industrial and municipal wastes to enhance sustainability by providing peer-reviewed reports; and
- ▼ Support scientifically defensible and consistent decision making at RCRA waste management facilities by providing a tested multimedia modeling system, supporting peer-reviewed technical reports, and providing technical support.

EPA's multi-year research plan for water quality sets a long-term goal relating to biosolids. As a part of that research effort, the Agency will develop approaches, methods, and tools for assessing



exposures and reducing risks that biosolid contaminants pose to human health. EPA will use these results to update guidance on biosolids support regulations.

## **HUMAN CAPITAL STRATEGY**

Advancing EPA's goal of protecting, preserving, and restoring the land requires a highly competent and motivated workforce to provide the technical assistance, training, and outreach tools needed by the Agency's partners. Our employees must create new partnerships with state and local governments, federal agencies, tribes, concerned citizens, and industry; ensure homeland security through their readiness to prevent and respond to acts of terror; and understand and apply appropriate insurance, real estate, and remediation strategies to promote the restoration and reuse of land.

Over the next few years, a substantial number of senior managers and employees currently involved in work supporting this Goal will be eligible to retire. To address this anticipated exodus, EPA will focus on building the talent needed to protect, preserve, and restore the land. The Agency's strategy includes developmental programs for staff; recruitment efforts, including establishment of partnerships with institutions of higher learning and rotational programs that provide cross-office experiences; and mentoring programs.

EPA will train its field responders extensively, providing scientific and technical training for detection, analysis, and response to chemical, biological, and chemical agents and training in incident command system response management processes. The Agency will develop and deliver training courses tailored to different levels of response experience and involvement: refresher courses for senior, experienced responders; in-depth training for newer responders in both scientific and response management areas; and training for all responders in state-of-the-art response techniques and emerging chemical, biological, and radiological threats.

EPA is currently developing training modules to assist EPA staff in implementing combustion permits. We will also continue to use communication technology, such as teleconferencing and internet-based conferencing, to provide technical training to EPA employees in such areas as making environmental indicator determinations and dealing with particular problems at corrective action facilities.

The land research program provides a scientific foundation for the risk management policies required of the Agency and supports the contaminated sites program and the waste management program. Over the next several years, the land research program will focus its human capital strategy on expanding its capabilities to secure and maintain expertise in characterization and monitoring methods, health and ecosystem effects estimation models, remediation and containment technologies,

multimedia modeling, sampling methods, land technologies, combustion, and chemical treatment technologies. To ensure that the EPA maintains the expertise it needs, the Agency is expanding its post-doctoral recruitment program and examining authorities to establish a pilot program for hiring additional researchers.

## **PROGRAM EVALUATION**

Program evaluation results did not significantly influence development of the Agency's goals and objectives for protecting and restoring the land.

## **EXTERNAL FACTORS**

EPA's ability to respond as the Federal OSC for releases of harmful substances in the inland zone will be impacted by several external factors. The NRS assures that EPA will respond when necessary, but relies heavily on the ability of responsible parties and state, local, and tribal agencies to respond to most emergencies. The need for EPA to respond is a function of the quantity and severity of spills that occur, as well as the capacity of state, local, and tribal agencies to address spills.

EPA's ability to respond to homeland security incidents may be affected by circumstances surrounding each event. For instance, if travel or communication is severely impacted, EPA's response may be delayed and its efficiency compromised. Also, in the case of a single large-scale incident, our Removal Program resources will likely be concentrated on that response, thus reducing our ability to address other emergency releases. In severe cases, EPA's current emergency response workforce and resources may not be sufficient to address a large number of simultaneous large-scale incidents.

In addition, a number of external factors could substantially impact the Agency's ability to achieve its objectives for cleanup and prevention. These factors include Agency reliance on private-party response and state and tribal partnerships, development of new environmental technologies, work by other federal agencies, and statutory barriers. Achievement of the release prevention objectives and attainment of our FY 2008 targets will depend heavily on the participation of states that have been authorized or approved to be the primary implementors of these programs.

Attainment of our waste reduction and recycling objectives will depend on participation of federal agencies, states, tribes, local governments, industries, and the general public in partnerships aimed at reducing waste generation and increasing recycling rates. EPA provides national leadership in the areas of waste reduction and recycling to facilitate public and private partnerships that can provide the impetus for government, businesses, and citizens to join in the campaign to significantly reduce the

amount of waste generated and ultimately sent for disposal. However, both domestic and foreign economic stresses can adversely impact markets for recovered materials.

State programs are primarily responsible for implementing the RCRA Hazardous Waste and Underground Storage Tank Programs. The Agency's ability to achieve its goals for these programs depends on the strength and funding levels of state programs. The ability to meet compliance standards is dependent on extensive training and a strong state presence. The Agency will build upon its commitment to provide states and tribes with technical support and training to increase UST compliance.